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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/594,630	06/15/2000	Richard Anthony Marino	AUS000111US1	9667

35525 7590 05/22/2003

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EXAMINER

SINGH, DALIP K

ART UNIT	PAPER NUMBER
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2676

DATE MAILED: 05/22/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

B

Office Action Summary

Application No.

09/594,630

Applicant(s)

MARINO, RICHARD ANTHONY

Examiner

Dalip K Singh

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Response/Remarks

1. This Office Action is in response to Applicant's Response/Remarks dated February 20, 2003, in response to PTO Office Action dated November 29, 2002.
2. Based on Applicant's persuasive arguments, the art rejection (paragraph 2 and paragraph 4) made in the prior office action has been withdrawn.
3. In response to applicant's argument that Murphy reference is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Murphy reference discloses and performs perspective division (Figure 1B) and provides the teachings of geometry engine, frame buffer in a graphics processing system.
4. Applicant's arguments with respect to art rejections have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,137,497 to Strunk et al. in view of U.S. Patent No. 6,518,974 B2 to Taylor et al., and further in view of U.S. Patent No. 5,973,705 to Narayanswami.

a. Regarding claim 1, Strunk et al. **discloses a** method in a graphics adapter for displaying an object, the method comprising: receiving position coordinates ("eye" coordinates 110 (eye space)) and texture coordinates ("object" coordinates 108 (object space)) for the object; and displaying the object using the adjusted position coordinates and the adjusted texture coordinates (...processes primitive data received from the host processor...the graphics primitives are typically specified by X, Y, Z, and W object coordinate data and R, G...S, T, R...texture data for portions of the graphics primitives...col. 8, lines 60-67; col. 9, lines 1-3...homogeneous window coordinates...col. 5, lines 38-40;). Strunk et al. **is silent about** inverting a depth coordinate associated with the position and the texture coordinates to form an inverted coordinate; multiplying the position coordinates and the texture coordinates by the inverted coordinate to form adjusted position coordinates and adjusted texture coordinates. Taylor et al. **discloses** inversion of a depth coordinate and multiplying this now inverted depth coordinate associated with the texture coordinates to form adjusted texture coordinates (...this function computes...for each of the polygon's input values...and $1/w$...texture perspective correction multiplies...by $1/w$...col. 4, lines 39-53). However, Taylor et al. **does not disclose** multiplying inverted depth coordinate being with the position coordinates. Narayanaswami **discloses** where $1/x$ operation is used for perspective projection of a vertex (col. 1, lines 27-

43). However, perspective correction involves $1/w$ operation. Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Strunk et al. with the feature “texture perspective correction using $1/w$ ” as taught by Taylor and modify Strunk-Taylor combination with the feature “ $1/w$ for perspective correction” as taught implicitly by Narayanswami **because** it provides a means for improved graphics data processing and related computations.

b. Regarding claim 2, Strunk et al. **discloses** a graphics pipeline comprising: an input, wherein the input receives graphics data, wherein the graphics data includes position coordinates and a depth coordinate for an object; an output, wherein the output transmits processed graphics data; a plurality of processing elements (modelview matrix M 100, projection matrix P 102, perspective division 104, viewport and device matrices 106, Figure 1 & 6), wherein the plurality of processing elements generates the processed graphics data (window coordinates 116, Figure 1), wherein a first processing element within the plurality of processing elements is connected to the input and a last processing element within the plurality of processing elements is connected to the output (Figure 1). Strunk et al. **is silent about** wherein a selected processing element within the plurality of processing element receives the position coordinates and the depth coordinate, inverts the depth coordinate to form an inverted depth coordinate, and multiplies the position coordinates by the inverted depth coordinate. Taylor et al. **discloses** inversion of a depth coordinate and multiplying this now inverted depth coordinate associated with the texture coordinates to form

adjusted texture coordinates (...this function computes...for each of the polygon's input values...and $1/w$...texture perspective correction multiplies...by $1/w$...col. 4, lines 39-53). Taylor et al. **is deficient** for showing multiplying inverted depth coordinate with the position coordinates. Narayanswami **discloses implicitly** inverted depth coordinate $1/w$ being multiplied with position coordinates to arrive at adjusted position coordinates (col. 1, lines 27-43). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Strunk et al. with the feature "texture perspective correction using $1/w$ " as taught by Taylor et al. and further modify Taylor with Narayanswami "reciprocal $1/w$ for multiplying position coordinates to achieve adjusted position coordinates" **because** it provides a means for improved graphics data processing for perspective correction and calculations.

c. Regarding claim 3, Strunk et al. **discloses** wherein a first stage (modelview matrix x 100, projection matrix P 102) receives the position coordinates and the depth coordinates and a second stage (perspective division 104). However, Strunk et al. **does not disclose** inverting depth coordinate and multiplying the position coordinates by the inverted depth coordinate. Narayanswami **discloses** inverting depth coordinate and multiplying it with position coordinates (col. 1, lines 27-43).

d. Regarding claim 4, Taylor et al. **discloses** multiplying the texture coordinates by the inverted depth coordinates (col.4, lines 51-52; col. 5, lines 44-45).

- e. Regarding claim 5, it is similar in scope to claim 3 above and is rejected under the same rationale.
 - f. Regarding claim 6, it would have been obvious to a person of ordinary skill in the art at the time invention was made to take advantage of multiplying a reciprocal term instead of a division operation and carry the multiply operation in a given number of clock cycles i.e., 5 clock cycles because multiply operation is repeated addition which is less computationally intensive as compared to a division operation which is well known in digital processing art.
 - g. Regarding claim 11, it is similar in scope to claim 1 above and is rejected under the same rationale.
 - h. Regarding claim 12, it is similar in scope to claim 1 above and is rejected under the same rationale.
7. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,137,497 to Strunk et al. et al. in view of U.S. No. 6,518,974 B2 to Taylor et al, and further in view of U.S. Patent No. 5,805,868 to Murphy.
- a. Regarding claim 7, Strunk-Taylor combination **does not explicitly disclose** a raster engine connected to the input and to the frame buffer, wherein the raster engine rasterizes the processed graphics data for display; and a geometry engine connected to the raster engine, wherein the geometry engine receives the graphics data from the raster engine, processes the graphics data to form the processed graphics data, and returns the processed graphics data to the raster engine. Murphy **discloses** the raster engine rasterizing the processed graphics data for display; a geometry engine connected to the raster engine,

wherein the geometry engine receives the graphics data from the raster engine, processes the graphics data to form the processed graphics data, and returns the processed graphics data to the raster engine (Figure 1B, Figure 2A,E). Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify the device as taught by Strunk-Taylor combination with the feature "frame buffer, raster engine and geometry engine" as taught by Murphy **because** raster engine provides a means to display image data on the display device (Figure 1B, 2A,E).

- b. Regarding claim 8, it is similar in scope to claim 1 above and is rejected under the same rationale.
- c. Regarding claim 9, it is similar in scope to claim 3 above and is rejected under the same rationale.
- d. Regarding claim 10, it is similar in scope to claim 6 above and is rejected under the same rationale.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Dalip K. Singh** whose telephone number is **(703) 305-3895**. The examiner can normally be reached on Mon-Thu (8:00AM-6:30PM) Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Matthew Bella**, can be reached at **(703) 308-6829**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Application/Control Number: 09/594,630
Art Unit: 2676

Page 8

Washington, D.C. 20231

or faxed to:

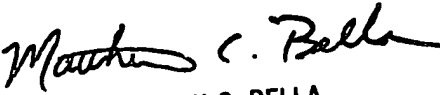
(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

dks

May 18, 2003


MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600